

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the present application:

1-33 (Canceled)

34. (Currently amended) A method[[,]] comprising:

communicating information between Internet protocol (IP) hosts ~~within a vehicle equipped with~~over a controller area network (CAN) bus and ~~vehicle modules within the a vehicle~~ by encapsulating an IP message in a CAN protocol message ~~to create a CAN/IP message, wherein the CAN/IP message includes an IP destination address.~~

35. (Currently amended) The method of claim ~~34~~66, including using the IP destination address to determine a next-hop IP address.

36. (Previously presented) The method of claim 35, including determining a CAN bus address based upon the next-hop IP address.

37. (Currently amended) The method of claim 36, wherein if the next hop IP address is a broadcast or multi-cast address, ~~using a CAN global address~~ is used as the CAN bus address.

38. (Currently amended) The method of claim 36, ~~wherein including,~~ if the next hop IP address is a unicast address, using an address resolution protocol request to determine the CAN bus address.

39. (Previously presented) The method of claim 38, wherein using an address resolution protocol request further comprises:

transmitting a CAN bus address request message on the CAN bus; and

receiving a reply message from one of the IP hosts, including the CAN bus address.

40. (Previously presented) The method of claim 36, further comprising:
transmitting the CAN/IP message to the CAN bus address; and
receiving the CAN/IP message at a first one of the IP hosts, which corresponds to the CAN bus address.

41. (Currently amended) The method of claim 40, ~~wherein~~ further comprising, after receiving the CAN/IP message, authenticating the CAN/IP message as being from a second one of the IP hosts.

42. (Currently amended) The method of claim 41, wherein authenticating the CAN/IP message further comprises:

extracting a CAN source address from the CAN/IP message, wherein the CAN source address is associated with the second of the IP hosts; and

comparing the CAN source address with known CAN addresses stored in an address resolution protocol (ARP) cache, which stores CAN bus addresses and IP addresses.

43. (Currently amended) The method of claim 42, ~~wherein~~ further comprising, if the CAN source address is not found in the ARP cache, verifying the CAN/IP message was sent from the second one of the IP hosts, wherein said verifying comprises:

transmitting a query message on the CAN bus to the CAN source address;
receiving a query reply message from the second one of the IP hosts verifying the CAN/IP message; and
adding the CAN source address to the ARP cache.

44. (Currently amended) The method of claim 41, ~~wherein~~ further comprising, after authenticating the CAN/IP message, determining the CAN/IP message type.

45. (Currently amended) The method of claim 44, ~~wherein~~ further comprising, if the CAN/IP message type is an ARP request corresponding to the first one of the IP host's IP address, sending an ARP reply verifying the first one of the IP host's address.

46. (Currently amended) The method of claim 44, ~~wherein~~ further comprising if the CAN/IP message type is an ARP reply to a previously sent ARP request, adding the IP address extracted from the ARP reply to the ARP cache.

47. (Currently amended) The method of claim 44, ~~wherein~~ further comprising, if the CAN/IP message type is a CAN/IP datagram, extracting and processing the IP message.

48. (Currently amended) ~~A system~~ An apparatus comprising:
a first Internet protocol (IP) host located within a vehicle, coupled to a controller area network (CAN) bus, and configured to communicate with a second IP host by encapsulating an IP message in a CAN protocol message to create a CAN/IP message, wherein the CAN/IP message includes an IP destination address; and
~~the second IP host located within the vehicle, coupled to the CAN bus, and configured to receive the CAN/IP message.~~

49. (Currently amended) The ~~system~~ apparatus of claim 48, wherein the first IP host is configured to use the IP destination address to determine a next-hop IP address.

50. (Currently amended) The ~~system~~ apparatus of claim 49, wherein the first IP host is configured to use the next-hop IP address to determine a destination CAN bus address.

51. (Currently amended) The ~~system~~ apparatus of claim 50, wherein the first IP host is configured to broadcast a CAN global address as the CAN bus address if the next hop IP address is a broadcast or multi-cast address.

52. (Currently amended) The ~~system~~apparatus of claim 50, wherein the first IP host is utilized to transmit an address resolution protocol (ARP) request to determine the CAN bus address if the next hop IP address is a unicast address.

53. (Currently amended) The ~~system~~apparatus of claim 52, wherein the first IP host is utilized to transmit a CAN bus address request message on the CAN bus, and to receive a reply message from the second IP host, including a CAN bus address.

54. (Currently amended) The ~~system~~apparatus of claim 4865, wherein the second IP host is configured to authenticate the CAN/IP message from the first IP host after receiving the CAN/IP message.

55. (Currently amended) The ~~system~~apparatus of claim 54, wherein the second IP host is further configured to extract a CAN source address from the CAN/IP message and compare the CAN source address with known addresses stored in an ARP cache, which stores CAN bus addresses and IP addresses.

56. (Currently amended) The ~~system~~apparatus of claim 55, wherein if the CAN source address is not found in the cache, the second IP host is configured to transmit a query message on the CAN bus to the CAN source address and, if the second IP host receives a query reply message from the first IP host, to add the CAN bus address for the first IP host to the ARP cache.

57. (Currently amended) The ~~system~~apparatus of claim 54, wherein after authenticating the CAN/IP message, the second IP host is configured to determine the CAN/IP message type.

58. (Currently amended) The ~~system~~apparatus of claim 57, wherein the second IP host is configured to send an ARP reply verifying the second IP host's address if the CAN/IP message type is an ARP request corresponding to the second IP host's IP address.

59. (Currently amended) The ~~system-apparatus~~ of claim 57, wherein the second IP host is configured to add the IP address extracted from the ARP reply to the ARP cache if the CAN/IP message type is an ARP reply to a previously sent ARP request.

60. (Currently amended) The ~~system-apparatus~~ of claim 57, wherein the second IP host is configured to extract and process the IP message if the CAN/IP message type is a CAN/IP datagram.

61. (Currently amended) A system[[,]] comprising:

means for communicating information between Internet protocol (IP) hosts within a vehicle equipped with a controller area network (CAN) bus and vehicle modules within the vehicle by encapsulating an IP message in a CAN protocol message to create a CAN/IP message, wherein the CAN/IP message includes an IP destination address.

62. (Currently amended) A method[[,]] comprising:

encapsulating an Internet protocol (IP) message in a controller area network (CAN) protocol message, to create a CAN/IP message including an IP destination address of an IP host on a CAN bus within a vehicle;

determining a CAN bus address ~~based upon~~ corresponding to the IP destination address; and

transmitting the IP message to the IP host by transmitting the CAN/IP message on a the CAN bus located within a vehicle to the CAN bus address; and

~~receiving the CAN/IP message at the IP host corresponding to the CAN bus address.~~

63. (New) The method of claim 62, wherein a CAN device and said IP host are coupled to the CAN bus.

64. (New) The apparatus of claim 48, wherein the first IP host is configured to communicate with the second IP host by transmitting the CAN/IP message over the CAN bus.

65. (New) The apparatus of claim 64, wherein a CAN device and said first and second IP hosts are coupled to the CAN bus.

66. (New) The method of claim 34, wherein a result of said encapsulating is a CAN/IP message which includes an IP destination address.

67. (New) The method of claim 34, wherein a CAN device and said IP hosts are coupled to the CAN bus.